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Long Wavelength Photoconductive Detectors for Airborne and Orbital Infrared Astronomy - Final Technical Report

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**Long Wavelength Photoconductive Detectors for Airborne and Orbital Infrared
Astronomy - Final Technical Report**

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The objectives of the NASA-Ames Agreement No. NAG 2-177 were fully met. Seven Ge:Ga detectors were mounted in Ames-supplied cavities and tested at low background at Cornell. In addition to the detectors, a cold preamplifier package consisting of J230 JFET's, load resistors and a thermometer/heater resistor -- all mounted in a light tight housing -- was built. The housing was designed to mount on the Ames-supplied focal plane assembly. The detector tests at Cornell indicated that the dominate noise under very low-background conditions was due to Johnson noise from the cold load resistor, $2E 10$ at 2K. No measurements of the current's responsivity were made prior to delivering the detectors and their cold electronics package to Ames.

The detector and the electronics package were delivered to Ames along with drawings of all the Cornell-supplied parts. In order to assist with the testing at Ames, we also loaned our test Dewar to Ames for the initial testing period. Subsequent tests at Ames indicated the presence of excess noise in the system. The detectors, electronics and Dewar were returned to Cornell by Mr. Philip Duffy for further testing. At that time it was found that the warm Ames-supplied electronics package was inducing the excess noise. Using the Cornell warm electronics eliminated this source of excess noise. It was determined that one of the power supplies in the Ames package was responsible for the noise.

The detectors have since been mounted in the Ames cold grating spectrometer and flown on the NASA C-141. Good quality astronomical data were obtained on a number of objects during a flight on 7 July 1983. Principal Investigator J. R. Houck of the agreement participated on the flight. At that time there was still the CGS Dewar. This problem is being pursued by the Ames personnel at this time.

The Cornell low-background Dewar was returned in good condition at the completion of the tests at Ames.